ISSN 1809-127X (online edition)
© 2010 Check List and Authors
Open Access | Freely available at *www.checklist.org.br*

Check List
Journal of species lists and distribution

NOTES ON GEOGRAPHIC DISTRIBUTION

Mammalia, Rodentia, Sigmodontinae, *Holochilus brasiliensis* (Desmarest, 1819): Distribution extention

Anahí E. Formoso*, Daniel E. Udrizar Sauthier and Ulyses F. J. Pardiñas

Unidad de Investigación Diversidad, Sistemática y Evolución, Centro Nacional Patagónico, CC 128, 9120 Puerto Madryn, Chubut, Argentina.
* Corresponding author: *formoso@cenpat.edu.ar*

ABSTRACT: We report the southernmost record for the marsh rats *Holochilus brasiliensis* 20 km S of Pedro Luro on Hwy 3, province of Buenos Aires, Argentina (39°41'31.13"S, 62°40'23.5"W) extending the range of the species ca. 110 km S. This represents the first contemporaneous record of *H. brasiliensis* in Patagonia, and also the only species of sigmodontine rodent with amphibious habits reported in Patagonia.

Rats of the genus *Holochilus* inhabit marshes, swamps, grasslands, and other moist, primarily open areas of South America, from sea level to approximately 2,000 meters (Hershkovitz 1955).

Two species of *Holochilus* occur in Argentina (see Massoia 1976; Cirignoli *et al.* 2006), namely *Holochilus brasiliensis* (Desmarest, 1819) with *H. b. darwini* Thomas, 1897 and *H. b. vulpinus* (Brants, 1827) as subspecies, and *H. chacarius* Thomas, 1906 including *H. c. balnearum* Thomas, 1906 and *H. c. chacarius* Thomas, 1906.

Holochilus brasiliensis ranges from eastern Paraguay, southern Brazil, Uruguay to northeastern Argentina and south-central province of Buenos Aires (Waterhouse 1839; Hershkovitz 1955; Massoia 1976). Interestingly, the first record for *H. brasiliensis* in Argentina (Bahía Blanca, Buenos Aires province; Waterhouse 1839) remained the southernmost locality for more than 170 years. The aim of this contribution is to extend the current geographical distribution of *H. brasiliensis*, reporting the southernmost locality known for the genus and species, which is also the first report in Patagonia.

In November 2006 we collected a sample of owl pellets generated by *Tyto alba* (Aves, Tytonidae) in an abandoned human building about 20 km S of Pedro Luro on Hwy 3, province of Buenos Aires, Argentina (39°41'31.13"S, 62°40'23.5"W; Figure 1). Pellets were disaggregated with hot water; osteological remains (skulls and mandibles) were recovered by hand and identified to the finest taxonomic level using specific literature (Massoia and Fornes 1969; Pearson 1995; Voglino *et al.* 2004) and reference material at the Colección de Egagrópilas y Afines "Elio Massoia" at Centro Nacional Patagónico (CNP-E, Puerto Madryn, Chubut, Argentina). The studied sample is housed at this collection with the reference number CNP-E 374.

The cranial and mandibular remains (an anterior fragment of skull and both mandibles all referable to the same young individual; Figure 2) were assigned to *Holochilus brasiliensis* because of the following combinations of characters: 1) moderately large size among largest cricetines; 2) lower and upper ridges of the masseteric crest meet at the level of the posterior root of the m1 and ventral to the mental foramen; 3) vestigial mesoloph present in the first upper molar (Hershkovitz 1955; Massoia 1976; Pardiñas and Galliari 1998; Voglino *et al.* 2004).

An additional 205 rodent specimens were found together with *H. brasiliensis* (N = 1; 0.48 %) including *Calomys musculinus* (N = 95; 46.12 %), *Akodon azarae* (N = 61; 29.61 %), *Oligoryzomys longicaudatus* (N = 33; 16.02 %), *Eligmodontia typus* (N = 13; 6.13 %), *Graomys griseoflavus* (N = 1; 0.48 %), *Mus musculus* (N = 1; 0.48 %), and *Reithrodon auritus* (N = 1; 0.48 %).

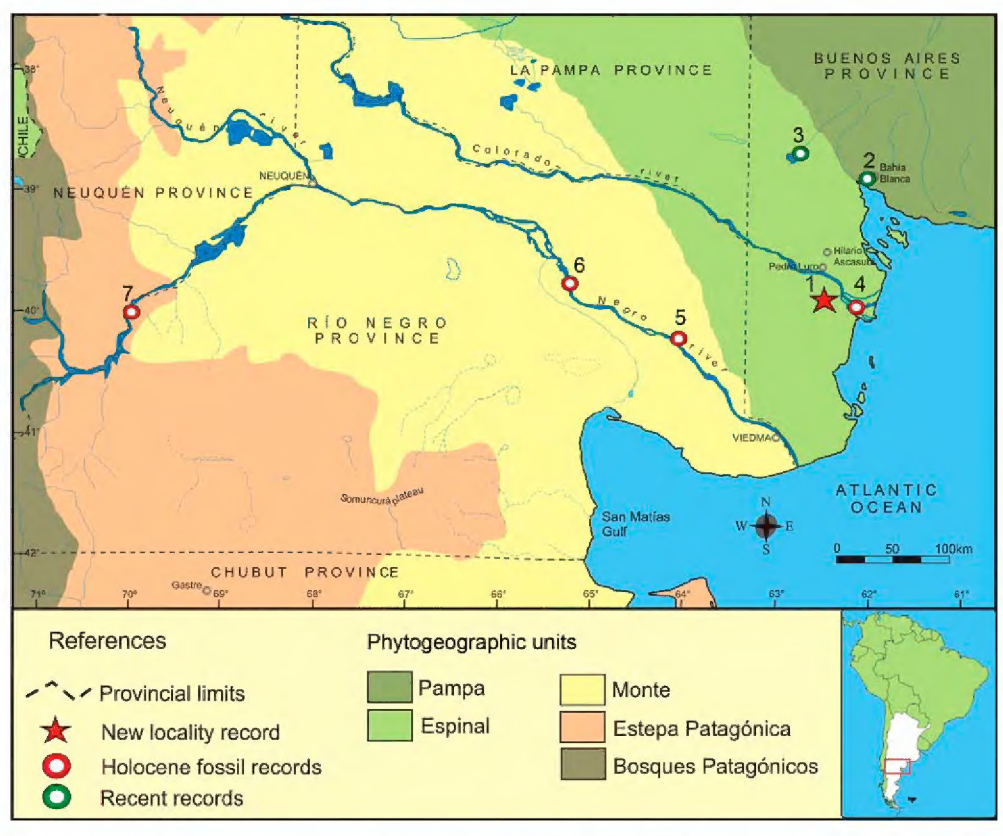

FIGURE 1. Map of northern Patagonia and adjacent areas showing the new locality for *Holochilus brasiliensis* ([1] 20 km S of Pedro Luro on Hwy 3), southern previous records ([2] Bahía Blanca, [3] Arroyo Chasicó) and Late Holocene occurrences in Patagonia (archaeological sites [4] El Tigre, [5] Angostura I, [6] Negro Muerto, and [7] Alero Arias). Main phytogeographic units according to Cabrera (1976).

This new find extends the current range of *H. brasiliensis* *ca.* 110 km S and constitutes the first contemporaneous record of this species in Patagonia representing the only sigmodontine rodent with amphibious habits reported in this vast region (see Pardiñas *et al.* 2003). Previous southern records of *H. brasiliensis* were reported by Waterhouse (1839) in Bahía Blanca based on a specimen collected by C. Darwin during the voyage of the Beagle; and by Massoia (1976) who listed two specimens obtained by J. Bianchini in arroyo Chasicó, 7 km upstream its mouth (see also Contreras, 1973).

We considered three likely scenarios that would explain the occurrence of *H. brasiliensis* in northern Patagonia: 1) This rodent is taking advantage of the currently-growing areas with irrigation channels, which might be used as dispersal corridors from the north of Colorado river to the south of it. In fact, in Hilario Ascasubi (a locality about 15 km N Pedro Luro, see Figure 1) "big red rats" were observed by the Instituto Nacional de Tecnología Agropecuaria personal when they burned the vegetation covering of an irrigation channel; 2) In addition to taking advantage of irrigation channels *H. brasiliensis* recent discovery in southern latitudes could be linked to global warming (*e.g.*, Moritz *et al.* 2008) which would induce Brazilian species to move southwards (Udrizar Sauthier *et al.* 2005); 3) This record represents a relictual population, remain of a wider past distribution, as *H. brasiliensis* was found in Late Holocene archaeological deposits (Figure 1) in the valleys of Negro River (Prates 2008), Limay River (Teta *et al.* 2005), and Colorado River (Stoessel *et al.* 2008).

Our finding highlights -once again- the suitability of owl-pellet analyses as a quick -although dirty- and effective approach to assess small mammal assemblages in poorly known regions. While more fieldwork needs to be conducted in unexplored areas of argentine Patagonia, collection of owl-pellets seems a cost-effective technique that ought to be used extensively.

Acknowledgments: Marcelo Carrera and Joaquín Pardiñas helped in the field; Darío Podestá took the photographs that illustrated this contribution; Sergio Seipke improved the English version; Instituto Nacional de Tecnología Agropecuaria (INTA) Hilario Ascasubi personal gave information about rodents. Consejo Nacional de Investigaciones Científicas y Técnicas (PIP 6179 to U. Pardiñas) partially funded field activities. CONICET provided economical support to the authors. To the mentioned persons and institutions our deep gratitude.

Literature Cited

Cabrera, A.L. 1976. Regiones Fitogeográficas Argentinas. *Enciclopedia Argentina de Agricultura y Jardinería* 2 (1): 1-85.

Cirignoli, S., P. Teta, U.F.J. Pardiñas and G. D'Elía. 2006. Oryzomyini Vorontsov, 1959; p. 166-175 *In*: R. Barquez, M. Díaz and R. Ojeda (ed.). *Mamíferos de Argentina - sistemática y distribución*. Sociedad Argentina para el Estudio de los Mamíferos, Mendoza.

Contreras, J.R. 1973. La mastofauna de la zona la Laguna Chasicó, provincia de Buenos Aires. *Physis Sección C* 32(84): 251-219.

Hershkovitz, P. 1955. South American marsh rats, genus *Holochilus*, with a summary of sigmodont rodents. *Fieldiana* 37: 639-674.

Massoia, E. 1976. Mammalia; p. 1-128 *In*: R. Ringuelet (dir.). *Fauna de Agua Dulce de la República Argentina*. Fundación editorial Ciencia y Cultura 44.

Massoia E. and A. Fornes. 1969. Claves para el reconocimiento de los roedores del Delta del Paraná (Mammalia). *INTA, IDIA* 253: 11-18.

Moritz C., J. Patton, C. Conroy, J. Parra, G.C. White and S.R. Beissinger. 2008. Impact of a Century of Climate Change on Small-Mammal Communities in Yosemite National Park, USA. *Science* 322: 261-264.

Figure 2. Remains of *Holochilus brasiliensis* found 20 km S of Pedro Luro on Hwy 3 (Buenos Aires province, Argentina). From top to bottom, anterior fragment of skull in dorsal, ventral, left lateral, and mandible in labial view. Scale bar = 10 mm.

Pardiñas, U.F.J., P. Teta, S. Cirignoli and D.H. Podestá. 2003. Micromamíferos (Didelphimorphia y Rodentia) de norpatagonia extra andina, Argentina: taxonomía alfa y biogeografía. *Mastozoología Neotropical* 10(1): 69-113.

Neotropical 10(1): 69-113.Pardiñas U.F.J and C. Galliari. 1998. Sigmodontinos (Rodentia, Muridae) del Holoceno inferior de Bolivia. *Revista Española de Paleontología* 13 (1): 17-25.

Pearson, O.P. 1995. Annotated keys for identifying small mammals living in or near Nahuel Huapi National Park or Lanín National Park, southern Argentina. *Mastozoología Neotropical* 2 (2): 99-148.

Prates, L. 2008. *Los indígenas del río Negro: un enfoque arqueológico*. 1ra ed. Buenos Aires: Sociedad Argentina de Antropología. 321p.

Stoessel, L., S. Bogan, G. Martínez and F. Agnolin. 2008. Implicaciones paleoambientales de la presencia del género *Ceratophrys* (Anura, Ceratophryinae) en contextos arqueológicos de la transición pampeano-patagónica en el Holoceno tardío (curso inferior del río Colorado, Argentina). *Magallania*, 36(2):195-203.

Teta, P., A. Andrade and Pardiñas U.F.J. 2005. Micromamíferos (Didelphimorphia y Rodentia) y paleoambientes del Holoceno tardío en la Patagonia noroccidental extra-andina (Argentina). *Archaeofauna* 14: 183-197.

Udrizar Sauthier, Daniel E., A.M. Abba, L.G. Pagano and U.F.J. Pardiñas. 2005. Ingreso de micromamíferos brasílicos en la provincia de Buenos Aires, Argentina. *Mastozoología Neotropical* 12 (1): 91-95.

Voglino, D., U.F.J. Pardiñas and P. Teta. 2004. *Holochilus chacarius* (Rodentia, Cricetidae) en la provincia de Buenos Aires, Argentina. *Mastozoología Neotropical* 11(2): 243-247.

Waterhouse, G.R.1839. *The Zoology of the Voyage of H.M.S. Beagle, under the command of Captain Fitzroy, R.N., during the years 1832 to 1836. Part II: Mammalia*. Smith, Elder & Co. London. 80 p.

Received: September 2009
Revised: December 2009
Accepted: February 2010
Published online: April 2010
Editorial responsibility: Ana Paula Carmignotto